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TROPICAL HOUSING & PLANNING

MONTHLY BULLETIN

for Dr. C. A. Doxiadis *

CLASSIFICATION SYSTEM USED BY DOXIADIS ASSOCIATES

A The Problems

B The Policies

C The Programs

D People, Development, and Ekistics **
Geographic factors
Industry
Agriculture
Transportation

E Houses

F Structures (exclusives of Houses)

G Community services

H Regions

I Major urban centers

J Market towns
(medium-sized and small towns)

K Villages
Rural land

L Farms

M Surveys
Census data
Topographical surveys

N Research

O Planning

P Financing

Q Urban land

R Labor

S Materials

T Construction
(systems of building and costs)

U Implementation

V Management

W Administration

X Legislation

**Refers to centers of activities in relation to their surrounding regions.

Appendices

*This report has been compiled for private circulation only by
Prof. J. Tyrwhitt, 77 Trowbridge St. Cambridge, Mass., USA.

TABLE OF CONTENTS (1)

A	National Planning Association. Special Policy Committee on Technical Cooperation. Technical cooperation in Latin America	1.
	Nelson, Lowry. Land reform in Italy	4.
B	National Planning Association. Special Policy Committee on Technical Cooperation. Technical cooperation in Latin America	1.
C	National Planning Association. Special Policy Committee on Technical Cooperation. Technical cooperation in Latin America	1.
	Nelson, Lowry. Land reform in Italy	4.
D	Keller, F. L. Institutional barriers to economic development -- some examples from Bolivia	2.
	Nelson, Lowry. Land reform in Italy	4.
E	Benincasa, Eglo. Houses in the sun: the Mediterranean tradition	9.
	La habitación rural en la región del Cuzco	10.
	Lee, D. H. K. Thoughts on housing for the humid tropics	12.
	Linke, Lile. Houses not hovels. How an Ecuadorean co-op got rid of Straw-mat Town	20.
G	Massachusetts Institute of Technology. Solar air conditioning	31.
	National Association of Home Builders. NAHB Research Institute issues final report on Austin, Texas, air conditioned village.	22.
J	Great open spaces: Prairie planning in Nairobi; Commentary on Nairobi, by Roger Johnson	24.
	Messina, Mario. Une ville residentielle en pleine nature	28.
O	Doxiadis, K. A. The Greek city plan	27.
P	La habitación rural en la región del Cuzco	10.
	Lee, D. H. K. Thoughts on housing for the humid tropics	12.
	Linke, Lile. Houses, not hovels. How an Ecuadorean co-op got rid of Straw-mat Town	20.
T	La habitación rural en la región del Cuzco	10.
	Massachusetts Institute of Technology. Solar Air conditioning	31.
Appendix 1. Current projects in North America		32.
Appendix 2. Theses for doctorate degree in American colleges, 1955		33.

1.

A

National Planning Association. Special Policy Committee on Technical Cooperation. Technical cooperation in Latin America -- recommendations for the future. Washington, The Association, 1956. 192pp., tables.

The report is a critical study of the public and private technical cooperation programs, their methods and results. The Committee evaluated the accomplishments, organization, and administration of the various programs of the U.S., and Latin American governments, the U.N., the Organization of American States, and many private agencies including business firms, religious groups, foundations, universities, trade unions, and others. From the beginning the Committee was concerned with the interrelationships between all of the programs. In addition, the Committee attempted to discover and to appraise the attitude of Latin America toward technical cooperation. And finally, recommendations were made on fields of technical cooperation, on their administration, and on policy for both public agencies and private groups.

The appendix contains tables summarizing the programs by country, field of endeavor, and total sums involved since 1951. As housing is included in General Community Development, financial data is not given for that subject. Table 39 (reproduced below) is a summary of Institute for Inter-American Affairs technical cooperation programs in General Community Development for thie year 1955 only, but the cost is not listed.

Country	Program Started	Projects in Operation, 1955
Brazil.....	1953	Housing and shelter improvement programs (3 community and area development projects include assistance in agriculture, education, health, child welfare administration).
Chile.....	1954	Housing joint fund agreement--self-help housing, in-service training, organization, and social welfare.
Colombia.....	1953	Project in housing development, including training.
Costa Rica....	1955	Housing, training in social welfare.
El Salvador...	1954	Planning survey, training.
Nicaragua.....	1953	Assistance in urban planning.
Panama.....	1954	Consultation in social welfare service and in medical social welfare, public health services, training.
Paraguay.....	1955	Technical assistance to social welfare education.
Uruguay.....	1955	Training in rehabilitation of mentally retarded children and vocational rehabilitation.
Br. Guiana....	1954	Community development and self-help housing.

Keller, Frank Leuer. Institutional barriers to economic development -- some examples from Bolivia. (Economic geography, Oct. 1955, vol, 31:4, pp. 351-363.) Humid

Dr. Keller's paper begins: "Perhaps in no other Latin American country does the institutional background play such an important role in delaying utilization of relatively abundant natural resources as it does in the land-locked central Andean Republic of Bolivia. Foremost among institutional factors contributing to the nation's economic peculiarities is the medieval system of land tenure which has permitted a privileged few to obtain unresticted control over large portions of the most fertile land. These properties are held in the iron grip of a system of ownership which places inordinate emphasis on the status quo. Efforts to alter the static, time-honored relationship between the man who owns the land and the one who tills it, toward increasing productivity and widening distribution of the economic return, are vigorously resisted. Since the assessed value of land held in great landed estates is low, and the tax rate is negligible, land capable of considerable productivity may lie idle while the inhabitants of the region suffer from extreme privation. Meanwhile, during the most inflationary period in Bolivian history the value of this idle real estate spirals rapidly upward."

In the article, significant factors involved in planned economic development are arranged under the topics: land, labor, and capital. The section on land tenure in the highlands of Bolivia is reprinted in part:

"Having been driven from their Mediterranean homeland by lack of opportunity on the land, the Spanish Conquistadores encountered on the bleak intermontane plateau of Bolivia, in contrast, a smoothly operating communal agrarian system which had survived for at least 20 centuries. Within the framework of these communal agglometations known as allyus, all land was held collectively. The European concept of private ownership of land was unknown on this lofty tableland until the Spaniard superimposed the manorial system on the indigenous communal landscape. Many Indian communities situated in more isolated recesses of the Altiplano managed to escape the initial onslaught and continue to survive, but their more arable lands are constantly being encroached upon by the expanding estates of private landowners. Several centuries of domination by static manorial life and inordinate emphasis on the extraction of minerals have contributed to the decay of agricultural practices and consequent social disintegration. Irrigation works have disappeared, agricultural terraces have crumbled, the land has become sterile, and flocks have been depleted. Although the smouldering restlessness of the Indians has been ruthlessly suppressed through the centuries, it has found outward manifestation in recent years in the form of passive resistance strikes during which Indians refuse to cultivate the owners' fields. As a consequence, estate agricultural production has been curtailed substantially.

Community Indians are also hedged around by physical and cultural barriers to material progress. For example, surviving communities are relegated to the higher, more infertile sectors of the mountains, a physical cleavage which has unfavorably influenced agricultural yields and crop varieties. Thus an altitudinal zoning appears to have emerged as these two mutually antagonistic institutional organizations--the Indian community and great landed estate--have struggled for control of the more favored physical sites. But the estate has increasingly dominated agrarian organization in Bolivia, thereby providing the landowners with economic security as well as social prestige and political power.'...

In the maintenance of human dignity the discrepancies between the great landed estate and the community are equally large. Estate Indians literally belong to the agrarian unit to which they are attached, and are held in this lowly status by vagabondage laws, unlawful coercion, and lack of opportunity, to put it mildly, elsewhere in the Bolivian economy. If Masaya [an Indian community] were sold, the Indian inhabitants would be included in the purchase price of the estate in that a subjective evaluation certainly would be made of their amenability and productive capacity. Although the tiny plots allocated to the Indian families are hardly enough to meet barest subsistence standards, the duties required in repayment are

time-consuming and often humiliating. The Indian agriculturist must plow, cultivate, and harvest the owner's fields using his oxen and primitive agricultural implements; he must care for and pasture the owner's livestock, shear his sheep, manufacture by-products, and transport the surplus produce to market. Invariably, these duties coincide with the period during which the Indian should be working his parcels of land if maximum production is to be realized under existing condtions. Moreover, the Indian by custom is required to serve the owner in his home in La Paz and in the haciendo house on the estate. Although the form of serfdom, termed pongueaje, has been outlawed periodically, the practice not only continues in many rural areas but is being extended to include onerous duties for the half-breed administrator on the estate who has unlimited authority over the inhabitants in the absence of the owner, who lives in La Paz and rarely visits the property".

Several paragraphs under the subject Capital are sufficiently pertinent to be quoted:

"Real estate taxation is one of the weakest links in the entire revenue system, the extremely low taxation favoring land speculation and permitting land to remain unproductive. Most of the country's urban and rural landholdings have never been assesed: therefore the contribution to national and local revenues made by these properties is negligible. Another huge portion of urban and rural holdings is assessed by the owners. Needless to say, the declared assessment probably does not even reflect the true original value of the land. Not to be overlooked is the fact that acute inflation has widened further the yawning gap between real value and assessed value. Rural real estate and income taxes (assessed value plus reported income from the property) amount to approximately 0.1 per cent. Consequently, much of the land best suited to agriculture can be held out of production instead of being devoted to growing the kinds of foodstuffs now absorbing the major portion of foreign exchange earnings.

Lack of economic activity in the region straddling the all-weather highway reaching into the potentially productive hinterland north of Santa Cruz serves to illustrate how institutional attitudes prevent fertile land from being utilized fully. After completion of a resources inventory, this region was selected by economic planners as the logical place to produce the staples and fibres now being imported with scarce foreign exchange. Although less than 10 per cent of the area along the highway is presently under cultivation, there is little evidence that the large landowners intend to develop the land. Instead, they are holding the choice properties for speculative purposes and as a hedge against the insidious inflation plaguing the economy. Consequently, agriculturists who wish to participate in the economic development program being instituted in the region are forced to utilize land out of profitable reach of the highway or less productive drier areas to the south of Santa Cruz. Campesinos (agricultural laborers) seeking good land to cultivate became so frustrated that in the fall of 1952 an unsuccessful rebellion, witnessed by the author, broke out in an attempt to redress this socially inharmonious use of the land. The agricultural development program in Santa Cruz will remain stillborn so long as there is no attempt to reconstruct the outmoded agrarian framework prevailing in that region."

In his conclusion the author states that "an attempt has been made to isolate and analyze in some detail what are considered to be the most stubborn cultural resistances to the economic development of Bolivia. For purposes of clarity in presentation, the illustrations used were grouped under three broad divisions representing cost-determining factors of production. It has been pointed out how contemporary attitudes towarded the utilization of agricultural land have resulted from a super-imposition of European manorial tenures on the indigenous communal patterns. The cross-purposes which have evolved in agrarian policy are serving to stultify productivity and hamper to a significant degree concerted efforts by foreign technicians to increase agricultural surpluses through technical innovation.

Although harsh physical conditions in the more populated regions of the country contribute to labor inefficiency, institutional barriers surrounding the pursuit of education, the search for better health, and the improvement of dietary standards seriously limit the productivity of the human resource. An imperfect blending of diverse cultures has produced an institutional dichotomy which may delay for some time formation of the national cohesion requisite for integrated internal development. Diametrically opposed political philosophies are driving laboring groups, organized and unorganized, into uncompromising opposition to political regimes which do not become completely servile to their demand for immediate economic betterment."

Nelson, Lowry. Land reform in Italy. Washington, National Planning Association, 1956. 48pp., illus., map, tables. (Planning pamphlet no. 97.) Dry

The author describes in broad outline the essential features of Italy's land reform program and appraises some of its results. Reform took place as a demand for the breakup of large estates in order to distribute land in small holdings to peasants. Some 80% of Italy is classified as hills and mountains, yet agriculture and forestry are carried on throughout nearly the entire country. Rainfall is scant in summer over most of Italy and is concentrated in fall and winter months.

The article continues: "The problem area is in the southern portion of Italy and the islands. Here there is heavy pressure of the population on the meagre land resources. Little industrial growth has occurred. Moreover, the land has been more largely concentrated in large holdings, and is farmed by tenants and wageworkers. Unemployment is chronic, and wages are very low; the people are ill-clother, ill-fed, and poorly housed. Feudal estates have been undisturbed for generations, held by landowners who reside in Rome, Naples, Palermo, or other cities, and who visit the estates only occasionally. For the most part, the rents are heavy and the land is poorly managed. Much of the land is used for grazing, or for hunting preserves. It was this condition which made agrarian reform a must project.

Table 1

Land Use on Productive Lands in Italy

Use	Area (acres)
Crop land	32,643,278
Tree plantations	6,098,591
Grass land for hay and pasture	3,036,496
Rough grasing	9,697,202
Woods and forests	14,109,565
Uncultivated productive land	3,074,408
Total productive area	68,659,532
Unproductive	5,764,724
Total area	74,424,256

Much of the land which has been expropriated comes out of the area listed in the table as "Rough grazing". It is probably not too much to expect that the work of land transformation will add from 1.5 million to 2 million acres to the three first categories, most of it to that designated as "Crop land".

Size and Ownership of Farms

In the cadastral survey (map of the quantity, value, and ownership of real estate for tax purposes) of 1946, land was classified as to the size and ownership of individual parcels. There were two ownership categories; natural persons, and corporate bodies. Most of the agricultural land is in the hands of'natural persons'..." Of the holdings by corporate bodies, over half is held by communes (townships). "These lands are mainly grazing and woodland and are generally not well managed. The rights to their use by citizens of the respective communes are, however, jealously guarded, but in spite of attempts by the central government to develop better supervision of their use for example, forest management--little progress has been made. The commercial companies are for the most part providing good management for their lands. The majority of these lands are situated in the Po plain and in central Italy--that is, in the better agricultural areas. ... "Near the ancient olive groves... one may see at work the great tractors pulling giant plows through meter-deep

rock and earth, or the giant rippers that tear loose the soft tufa stone to a depth of more than three feet.

These high-powered machines are tearing loose rock that was laid down geological ages ago in the ocean bed, but rock that still has not metamorphosed into hard limestone. Nevertheless it is rock, and its removal from the land constitutes a work of staggering proportions. The larger cakes of tufa must be broken so that human hands can grasp and arms can lift and carry them to a pile. Piles ultimately appear as thick as cocks of grain in a fertile field. They must be hauled or carried away--to build wall fences, to make shelters for animals, or merely to be ricked up to occupy as little space as possible.

Beyond the rock-piled acres, one sees the rows of white houses on land reclaimed from tufa rockhouses already occupied, houses ready for occupancy, houses in course of construction. To visit these, one is driven over newly constructed, all-weather roads, lined with trees at most two years out of the nursery, but flourishing like wellfed infants. Here is the new home of a family which only a year ago lived in a one-room hovel in a town several miles away where the solid rows of cave-like rooms fronting on a narrow street were all occupied by bracciante (casual agricultural laborers), annual hired workers, or share tenants. They once worked upon this same land which they now occupy as proprietors, but to get to it they had to travel with their donkey or mule, sometimes hitched to a large two-wheeled cart, for two, four, six, or even twelve miles. Then at the day's end, they trudged the tired road back to the dismal quarters they had for a home.

Now they have a new well-constructed house consisting of a combined kitchen and living room, two bedrooms and a storage room. Attached to the house and entered from the door opposite that of the kitchen is the stalla for the cows and the mule, horse, or donkey, as the case may be. The house is lighted by electricity, or will be. There is running water, or there will be when electric service is installed. In any case, a potable source of water is near, either from a well or from a tap. Each family has on the average about twelve acres of land, more or less depending on the type of agriculture which is to be followed. Each has some livestock; in some places pure-bred dairy cows, in others sheep. But the most important animals provided are dairy cows. Farm work of the heavy sort is accomplished by modern implements and tractors through the machinery pool.

Italy's farmers, especially in the south, have lived in villages and towns from ancient times. These villages are usually perched on top of high hills. The amount of energy employed in moving crops and supplies to and from the fields can only be imagined. It is said that the hill-top towns were built originally for the sake of protection, to escape some of the dangers of malaria, or, as some maintain, to avoid the tax collector. At any rate, the removal of the danger of human enemies these many years past, and the more recent conquest of malaria, have not even suggested to anyone the rebuilding of these towns in more accessible and rational localities. ...

Thus it is with the recent occupants of these new houses. They too were hill-toppers. But now they are dwellers on their own farms. This transfer from village life to open-country settlement is one of the more important aspects of the new Italy. ...

The rural villages, sometimes completely new, sometimes consisting of the remodeled structures of an old baronial estate, will uniformly contain the following facilities: a church, a five grade elementary school, a nursery and kindergarten, a recreation hall including a cinema, a first-aid center, a market place, and rooms for shops and stores. There will also be houses for the school teachers and for the parish priest. At intervals between these major centers, there will be social service centers of a simpler sort, consisting mainly of a school, a general store, a chapel, and a first-aid center.

Separate from these social service centers are the centers for technical agricultural services. Here are the machinery and tractor pools, livestock breeding centers, places for the storage of seed and fertilizer for distribution to the settlers, and storage facilities for crops on the way to market.

In one center, for example, there was a newly constructed winery in another a tobacco-curing shed. Also trade schools are maintained in some of these centers to teach the children of the settlers modern methods of agriculture and of livestock production.

Makers of the New Italy

The transformation of the rural landscape of Italy is the work of the new land reform agencies, Enti per la Riforma Fondiaria, working in cooperation with an older agency, which for simplicity we may call the Reclamation Service... Under the Sila Law all those owning landed property exceeding "throughout the entire national territory" the amount of 300 hectares (750 acres) were subject to expropriation. The phrase "throughout the entire national territory" is important, for it made possible the expropriation of an owner's total holdings in a given area, if perchance he had land in other parts of the country....

Provision for Retention of Land

Under the "Extract Law" a landowner who wishes to do so, may reserve one-third of his expropriated area up to a maximum of 300 hectares, provided he will undertake to carry out works of transformation similar to those which the Ente--or government corporation--caries out on the land which it takes over. Plans must be approved by the Ente, and requests to make such reservation must be made to the Ente within 60 days from the date of publication of the notice of expropriation. If the owner executes this work to the satisfaction of the Ente, he is allowed to keep half of the one-third for his own, but the other half must be turned over to the Ente as expropriated land. The Ente, however, will compensate him for the improvements he has made, as well as giving him the regular indemnity for expropriate land." The economic limitation of the small holdings which the land reform agency assigned will be partly mitigated by the program called land transformation. This includes a broad list of activities intended to produce a drastic change in the character of the land and its utilization. Among activities included are the following:

"Subsoiling. In some parts of the country this is for the purpose of breaking a hardpan; in others it is for the loosening of the soft tufa stone in order that it may be removed. In either case, plowing to a depth of nearly three feet is undertaken by a huge plow, or else--in the case of stone removal a ripper with one to three prongs is used which is capable of tearing the earth to a depth of a yard or more.

Control of water (sistemazione idraulico). This may involve drainage or irrigation or both. It may also involve terracing the land, installing check dams, and making other works for prevention of erosion. Most of the drainage is by surface drains. In Fucino, where an old lake bed was drained nearly a century ago, the canals which catch the water around the rim of the basin are being modified so that the direction of flow is reversed. This and other works will prevent the periodic flooding of the lowest part of the basin which has been one of the problems under the old system.

Consolidation of tracts. Over the centuries land around the villages has become badly subdivided and fragmented, so that an individual with even a small total holding may have a number of different pieces located in different directions from the village. This fragmentation occurs in the case of rented, as well as owned land. Efforts have been made for years to rectify and rationalize this system, but little progress has been made. When the land reform agency takes over land which is highly fragmented, it makes a complete reorganization of the division of land, so that the new settler will have his land in one piece or at most in two.

Road construction. The reorganization of the fragmented land means naturally that new access roads have to be built. But in addition, the agency attempts to see to it that its area is provided with main roads connecting them with the outside world. For example, in the Ionian coastal area known generally as the Metaponto, a main highway was constructed across the entire area connecting with highways beyond. This highway was made possible only because water was brought under control over the area.

Tree and vine plantings. One of the more common methods of changing to intensive from extensive farming is to plant the transformed area to vines, olives, almonds, citrus, or other tree fruits. In the aggregate many millions of trees and vines have been planted on the settlers' farms. In addition to the trees mentioned, windbreaks are almost universally part of the program of land transformation. Shade trees line all the new highways; one imagines that in the space of a very few years the aspect of the landscape will be greatly changed, and much for the better.

Introduction of livestock. Another device for creating intensive agriculture is the provision of income-producing livestock. The type of livestock will depend on the area, naturally, but the emphasis appears to be on cows of the dual or triple purpose types. Where horse or mules are the common animals used for work, the agency is attempting to get the farmers to shift to cattle for the work which cannot be performed by mechanical power. For milk and meat, the favorite bread is the Brown Swiss with occasional Holsteins; for milk, meat, and work, Simmenthal cows imported from Switzerland; for work and meat the native Italian Marchigiana breed is favored. There are usually chickens and a pig on the allotments, and occasionally there are sheep.

Farm structures. A house for the family is naturally one of the first considerations. Generally, this is a four-room structure, with a kitchen-dining-living room and two bedrooms, plus a storage room which often serves as a bedroom for a member of the family. Attached to the dwelling is the stalla for the cows and mule or horse. Some are two story houses with the family occupying the upper part and the animals and storage space the lower. A usual outbuilding is the forno, or oven for baking bread. Sometimes a single forno is built to serve two families. Often the oven is part of a larger structure which has on one side of the forno a small chichen coop and on the other a pen for the swine. There may be in addition a silo for storage.

Water and electric services. Along with the construction of the houses goes the provision for domestic water supply and ultimately for electric service. All the projects contemplate both of these services, but the provision of potable water is a primary necessity. Generally, the source is wells. There is not always a well for each house, however, In the Metaponto, for example, there is a well for each two houses. (These wells, incidentally, were the work of the Irrigation Section of the Ente per lo Suiluppo della Irrigazione in Puglia e Lucania e Riforma Fondiaria. The Irrigation Section is an older agency deriving from an act of 1933, but with responsibility and competence in the field of water development and control.) Electric service is not an immediate concern, although it is expected that it will be eventually installed, if not in the near future.

Rural village and service centers. As mentioned earlier, one of the more interesting aspects of the entire program is the construction of rural trade centers and hamlets. The necessity for these grows out of the relocation in the open country of populations which formerly lived in towns and villages. In most of the land reform areas there were no residences in the open country. Now there will be thousands of new dwellings. The people will need social and economic services located closer to their homes than the villages from which they moved. The agencies are seeing to it that these centers are provided.

In some cases, whole new villages are being constructed; in others, buildings which served as "ranch headquarters" for the previous owners are being remodeled and put to use, with such supplementary construction as is necessary. For example, at Borgo Liberta in the Foggia area, a 17th century church and monastery are being repaired and remodeled for use, along with the buildings which were previously used as storage rooms or residences for the managerial staff and laborers. These are being supplemented by a new kindergarten and nursery, an elementary school, parish house, and a house for school reachers. It will be a trade and service center for 400 families who will occupy the expropriated lands in the vicinity.

In addition to the full-scale rural trade centers, there will be service centers of a simpler type at intervals throughout the countryside. These will consist of an elementary school, a small chapel, a first aid center, and a general store, including a house for the storekeeper.

To serve the technical agricultural needs of the settlers there are the Centri d' aziendale. These consist of the machinery pools, storage facilities for seed and fertilizer, and for the present at least, there are frequently dairy herds of cows destined for ultimate distribution to the settlers, In one such center in Puglia, there is a newly constructed winery for processing the grapes grown by the settlers. In another there is a tobacco-curing plant. It is presumed that when as presently intended--the settlers through organized cooperatives will take over management of these enterprises, they will continue in these central locations. There is an azienda for each 200 settlers on the average."

9.

E.

Benincasa, Eglo. Houses in the sun: the Mediterranean tradition. (landscape, autumn 1956, vol. 6:1, pp. 13-18, with illus. Dry

From Eglo Benincasa, L'arte di habitare nel Mezzogiorno, 1955-56.

The author writes of southern Italy with its architecture closer to the style of North Africa or the Near East than to more northern sections of the peninsula. Of Mediterranean architecture, he says it has be be colored to respond to the challenge of the savage glare of the sun. White is essential. Furthermore, it is practical; whitewashing keeps villages neat and clean. It enhances the purity of architectural design, It also perpetuates a Mediterranean tradition and establishes a link between the ancient and modern building.

Southerners habitually live in the open, but in an open sheltered from sun and wind, their dwellings face the courtyard or patio, a private interior space. Ancient social life centered around the portico. Today, it is concentrated in passages and arcades, in open cafes and in village squares. The small squares surviving from Medieval city building are spaces for living, integral parts of the adjoining houses. Children play and grown-ups talk; there is a neighborliness and atmosphere, a satisfaction for psychological needs. Domestic architecture today must plan to merge exterior and interior space, to preserve open spaces and yet to protect them from sun and wind and the curious.

The compact and sturdy character of southern architecture is sometimes the result of economy of materials, but the result is effective and strong in appearance. Variety of form has been achieved with rustic materials that harmonize well with the landscape of contorted trees and sparse vegetation.

10.

E.

La habitación rural en la región del Cuzco. (El Arquitecto peruano, Jan.-Feb. 1956, vol. 20:222-223, pp. [6-8], with illus., plan.) Dry

The article describes a model rural dwelling built in Chinchero for 4,000 Soles ($200). The architect was Jaime López Solórzano who planned the house for the Junta de Reconstrucción del Cuzco at a cost not to exceed 4,000 Soles. Basic economic and living conditions were taken into consideration with the expectation that such a house could be paid for in eight years. The dwelling, a model for better housing, is not considered ideal, but is a transition from present buildings to a more desirable type of structure. It is necessary to make clear that this transition period cannot be avoided because, at the beginning the inhabitants will have to have a different environment providing basic requirements in order to understand the disadvantages of overcrowding and mixed use, and more importantly, to accept this type of investment.

With the native inclination to collective work, it was possible to utilize this as a resource for a program of self and mutual help in building.

The model house, 65 meters quare, consists of two bedrooms, storeroom, kitchen, hall, and sanitary silo roofed over and conveniently separated from the living quarters.

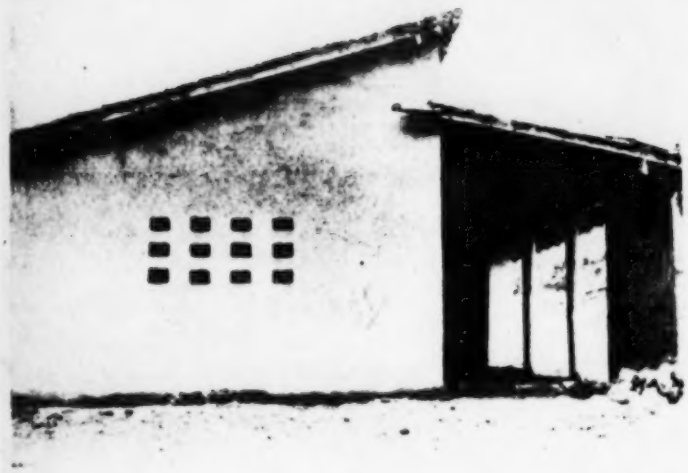
The span between walls has allowed use of beams with lateral supports creating different levels in the roof and high windows for good cross ventilation. The storage room has holes for ventilation and its size can vary according to the needs of the family. The kitchen is open with the same kind of holes for ventilation. In the original plan the floor was of pressed earth, but broken bricks were used, laid on edge.

The inside walls have been coated with clay made of sifted earth and painted in distemper.

Materials used belong to the region and work was done on the site by the builders. Only doors, windows and beams were bought.

The cost of the model house was 5,944.64 Soles not counting labor in the self and mutual help program, which would be worth approxiately 33% of the cost, making the price 4,221.90 Soles ($211) or 64.95 ($3.25) per square foot. If cost of tile for roof and cost of floor are discounted, with pressed earth used instead, the cost would be 3,096.3 Soles or 47.64 ($2.40) per square foot.

Houses have actually been build in Yanaoca, Pucyura and Chinchero, and the bank is willing to extend future loans for this type of housing in Chinchero. The design of the model house is simple and its execution does not require technical direction.



Una casa rural en Chinchero por cuatro mil soles

Arquitecto:
Jaime López Solórzano

Junta de Reconstrucción del Cuzco

12.

E.

Lee, Douglas H. K. Thoughts on housing for the humid tropics. (Geographical review, Jan. 1951, vol, 41:1, pp. 124-147, with illus., diagrs., table.) Humid

Spanish translation published by Centro Interamericano de Vivienda, Servicio de Intercambio Cientifico, 1953.

The discussion is divided into consideration of the main structural features: roof, walls, floor, partitions, and is followed by remarks on facilities, layout, air conditioning, and finally by examples from various countries.

The roof: As illustrated in an accompanying diagram the amount of solar radiation, when the sun is high, is a function of floor space and wall height, the pitch of the roof being of no consequence. But when the roof pitch exceeds the solar altitude, as happens with low-altitude suns, the greater the roof height, the greater the solar exposure. Protection for roof area is provided by the following means: external shade, reflaction of radiation, and insulation.

Trees may provide shade but they have certain disadvantages due to falling leaves, and branches, and also encourage birds, monkeys, snakes, and flies.

Reflection of radiation is the next method. Reflectivities of surfaces and materials are summarized: "About one-half of the total energy contained in solar radiation is propaged by wave lengths lying within the 'visible' range...and the extent to which this is reflected can be roughly judged by the brightness of the surface. Certain paints may reflect 85-95 per cent of visible radiation, aluminum metal 70-85 per cent, ordinary white paints 70-80 per cent, whitewash 50 per cent, brick 25-50 per cent according to the color and surface, monel metal 60 per cent, gray paint 25 per cent, black paint 4 per cent."

Insulation is the third method on which author makes the following observations: "Still air has a very low thermal conductivity... Many dry vegetable and animal fibers (cotton, silk, wood fibers) also have a low conductivity. Materials built up of such fibers enclosing air spaces naturally have low conductivities, but substances with higher conductivities, such as silica, can be used in dispersed form to trap air and give fairly rigid materials with low total conductivity. Air can also be trapped between successive layers of material, but the insulation afforded by any one air layer will not increase with the thickness of the layer over 0.7 centimeter, owing largely to the induction of thermal convection currents.

"Materials and structures that depend on low thermal conductivity alone simply present a high resistance to the passage of heat; structures that depend on heat storage prevent its passage by absorbing heat locally, so that there is less to pass on. To do the latter, materials should be used that have a high specific heat and or a high density. If such properties can be combined with a low thermal conductivity, then both processes can cooperate. The physical property that defines such combined powers is termed "thermal diffusivity.' A low diffusivity is desirable.... It is interesting to note that the common building materials, wood and clay, have low diffusivities, and that it is desirable to exclude air from, but (where other circumstances permit) to include water in, materials where low diffusivity is required."

As roofs are as important for protection against rain as against sunshine, the following suggestions are set forth: "A continuous impermeable sheet of durable material, such as metal, is simplest but not always practicable. Discontinuous surfaces may be used if the breaks face away from the direction of rain drive (especially in places where rain is not accompanied by much wind), if the interstices are kept small and lie between repellent material, or if adequate absorptive material is provided in the deeper roof structure. Thatch

and canvas furnish something of a combination of the last two, repelling most water but absorbing some and reducing the size of the interstices by swelling with absorption. Semiabsorptive clay or concrete material may have a particular advantage in drier tropical areas in permitting cooling by evaporation after the period of rain. A relatively high pitch minimizes the amount of water entering apertures occurring purposely or accidentally in the roof surface."

The walls: Diagrams show that in tropical regions "the east wall for the first three hours of the day and the west wall for the last three hours are subjected to radiant heat loads equal to that on the roof at those hours, but that the loads are much smaller than that borne by the roof during the middle six hours of the day."

Reflection of radiation and insulation applies to the walls as well as to the roofs. Effective shade can be provided by eaves of appropriate projecting width. Natural air movement must be permitted by openings in walls facing the prevailing breeze. Such means of ventilation, however, must be protected according to preference. Common choices are screens, verandas, louvers, blinds, and casement windows.

And finally, condensation must be minimized in both roof and walls by the use of building paper.

The floor: an earthern floor, while cheap, tends to remain damp and dirty. Semiabosrbent material resting on the earth deteriorates rapidly as it is subject to surface flooding. Impervious material resting on the earth should be durable and relatively dry. But, if the floor is constructed off the earth, it will be both drier and cooler.

In general, the layout of houses should be arranged for cross ventilation. Doors and windows opening on opposite sides take advantage of prevailing air currents. Curtains can be substituted for solids. Partitions should not run counter to the breeze, at least without space between floor and ceiling.

The article concludes with examples of housing units and their costs in various parts of the world:

India

"Three groups of people call for special attention; industrial workers, rural workers, and refugees from Pakistan. It was reported in May, 1949, that the Government of India has instituted a scheme to build one million houses over a period of 10 years, at an estimated cost of 900 million dollars.(In earlier reports the cost was given variously as a total of 300 million dollars and $2250 per house in Bombay and Calcutta.) Of these, 725,000 will be for factory workers, 200,000 for plantation laborers, and 75,000 for dock workers. The central government will contribute two-thirds of the cost in the form of interest free loans, and provincial governments will contribute one-third. Rent will be paid by both employers and employees. Each house will have two rooms, kitchen, bathroom both fron and back verandas, and, in the case of single story houses, a courtyard. Community facilities will also be included. A separate scheme for building 50,000 houses for coal miners was already under way at that time.

"For refugees, it was reported at the end of 1948 that nearly 3000 tenements were complete or nearing completion in the Bombay area, and that more than 5000 military huts in Bombay had also been made ready for occupation. A few months later is was reported that three new townships would shortly be ready in East Punjab Province to accommodate 1,200,000 refugees, one near Bombay for 100,000 and one in the United Provinces for 25,000. The latest report-- August, 1950--is that 2,270,000 out of 3,500,000 refugees from West Pakistan have been given roofed accommodation but only a fraction of them are in new houses or tenements. Some 8 million dollars has been spent for this purpose, and another 19 million allocated. For refugees from East Pakistan, some 24,000 houses are planned in the current year.

"To implement these and similar schemes, housing boards have set up, organization for materials research instituted, and facilities for prefabrication and labor saving construction devised. "Guniting," for example, is a process by which a mixture of one part of cement and five parts of sand is sprayed into a wire or bamboo framework. It is asserted that a 320-square-foot house can be built by this means in one day, at a cost of about $600. Another process makes bricks from "stabilized earth" and 1 per cent cement, with which, it is stated, a two-room house with kitchen and veranda can be built for $525.

"To Americans these costs may seem low, but they are very high for workers earning $120 to $200 a year, and it is difficult to see how much more than bare shelter can be provided. If the rate of population increase maintains its present level (an estimated 3 1/2 to 4 millions a year), all the schemes so far listed would appear barely sufficient to take care of that increase, let alone improve existing conditions or replace normal decay. The action to date is a praiseworthy start, but it will have to be increased many times if real and lasting imporvements is to be obtained."

East Africa

"A plan for Mairobi was noted in the January, 1949, number of the Georgraphical Review, in which the planners were looking to a future population of 250,000, with Africans, Asians, and Europeans in the present ratio of 6:3:I. The climate of Nairobi is scarcely tropical, since the mean maximum temperature of the warmest month is only 81°F. and the corresponding vapor pressure about 12 mmHg. Mombasa, on the other hand, is in the equatorial lowlands of Kenya, a mean maximum temperature for the warmest month as high as 87°F. and a corresponding vapor pressure of about 20 mmHg. An official publication in 1946 described a housing scheme for the then African government servants, of whom only 356 married men and 148 bachelors required accommodation; the town of Mombasa itself had a population of about 65,000 at the date, most of whom were not covered by the scheme. The house planned were to be of concrete blocks, with tiled but unceiled roofs, and would provide for two of four families; each unit was to have one or two rooms (according to sixe of family and economic status), kitchen and storeroom, and veranda, and the houses would be grouped around common washing and sanitation facilities.

The Acting Commissioner for Local Government has recently supplied the following unformation.

'An interesting method of tropical building, outside large townships, has been in use at Kihfi, on the Coast, for a few years past. This consists of building circular huts of coralconcrete rammed between shuttering and roofed with palm-leaf thatch. The cost, excluding the capital cost of shuttering, is about £ 15 £ 20 per house about 12 feet in diameter andsufficient to house 2-3 Africans. The rate of construction is very rapid and can be carried out with practically unskilled labour. The floor is also made of coral-concrete and doors and windows are fitted in spaces formed in the circular was by solid partitions in the shuttering.

'The houses can be completely circular, or by adding straight shuttering between semi-curcular endshuttering, an oblong house with rounded ends can be constructed, and can, of course, be of almost any desired length.

'This conforms to the shape and type of the normal African bush house but is practically verminproof and far more sanitary than usual African dwelling.

'European housing throughout the Colony consists of standard types erected by the Public Works Department similar to offical houses in other Colonies, except that in malarious areas such as Kisumu, the houses are screened all round by mosquito--gauze. At Wajir, attitude under 1,000 feet above sea-level, in the Northern Frontier of Kenya, where rainfall is negligible and temperatures high, houses have been built of kunjur limestone with very thick walls (2 to 3 feet) and flat roofs, which are used as sleeping verandas. The general impression is the Beau-Geste type of desert fort.'

The Commissioner has also drawn attention to an excellent publication from the Kenya Labour Department, giving details of house construction for labours.

In southern Tanganyika, 'Messrs, Balfour, Beatty and Co., Ltd, have laid out a model native township, where the African worker can settle with his family and enjoy community life'at the Mtwara port construction.

Nigeria

"Considerable attention is being given to the housing problem here, to judge from material just received from the Public Department at Lagos." Four categories are described: (i) for Senior Service Staff (mostly Europeans), at a cost of 19.5 to 27.2 cents a cubic foot with units, including services and furniture, from $4500 in a six-apartment building to $84.750 for the most expensive house; (ii) for Junior Service Staff (Africans), at a cost of 17.8 cents a cubic foot, with units from $1600 to $2480, exclusive of services and furniture; (iii) for police barracks, at a cost of 19.5 cents a cubic foot; (iv) African housing, financed by the African Staff Housing Board, in "three room" to "six room" houses, at a cost of 13.0 to 16.6 cents a cubic foot, a project that has greatly increased recently and includes major schedules at several centers.

A letter from the Director of Public Works at Lagos says:

'Construction generally takes advantage of local materials available, transport costs being high. Cement blockwork forms the usual walling medium, but stone and brick are also used, where available, and landcrete walling (stabilised earth-cement) is now adopted. Pine and timber walling are used only in temporary buildings, owing to termite depredation and high maintenance costs. Imported materials form 25% (approximately) of the toal cost of Senior Service housing, and cover cement, roofing material, sanitary fittings, glass ironmongery, nails, screws, paint, piping, electrical and water fittings. Labour accounts for some 40% of the total cost. These percentages alter until reaching the 'low-cost' housing stage, which works out a approximately 17% with cost of labour at 50%.

'Much damage has been caused by both subterrancan and dry-wood termite, of which there are many species, and various remedial measures have been introduced. In all new buildings an anti-termite carpet of one part arsenic to ten parts of sand laid one inch thick in specified under all foundations and ground floors. It may be of interest to more that the activities of the dry-wood termite are confined mainly to Lagos, Ibadan, and Port Harcourt, where pitch pine, imported from U.S.A. in 1919/21, was used.'

Australia

"The major task of incorporating scientific knowledge into planned housing in Australia falls on the Commonwealth Department of Works and housing, with its Experimental Building Station near Sydney. Town planning for the Northern Territory, Papua, and New Guinea, together with house desing, has been pushed to a fairly advanced stage, but in the face of most of the difficulties enumerated earlier the translation of these plans into actual housing has been rather slow. Recommended house designs have been published in brochure form. The chief features are the large wall louvers, the long axis of the building at right angles to the prevailing breeze, and the wide overhanging eaves. Most of the designs retain a feature familiar to inhabitants of tropical Australia, and one that has been the subject of considerable argument--raising the house off the ground on "stumps." The principal advantage is that floors are dried and, to a certain extent, cooled, If they are raised to seven feet, the space beneath the house proper can be used as a garage, storeroom, laundry, or daytime living space (Figs. 8,15,23). As with the veranda, however, the original intention can be subverted by entirely enclosing the space; the result is simply a two-story house. This process is hastened by the servantless housewife trying to tend the upstairs house and the downstairs children all at the same time. Certain stages in this transition, with the production of a two-story "flat," can be seen in the designs given in the brochure.

"For Darwin, the chief town and port of the Northern Territiory, at once the northern gateway and remote outpost of the eccentrically developed island continent, elaborate town plans have been adopted. These, it is asserted, will not only provide for immediate needs but also give full opportunity to further growth. Residential areas are drawn in the form of units, each with services for 2000 to 5000 persons. Measurement of atmospheric conditions in the new buildings are compared with predicted conditions, and with experiments on models, so that both principles and practice can be improved as work progresses.

Puerto Rico

"The poor economic conditions on the island of Pueto Rico have been given some publicity, but similar conditions obtain in many other part of the Caribbean area. In Puerto Rico, however, there is evidence of considerable activity directed toward improvement, and housing is one of the fields, In 1940, 53 per cent of the urban houses and 90 per cent of the rural houses were classifed as "slum," valued at less than $500. A further 20 per cent of the urban houses and 6 per cent of the rural houses were classified as "lower minimum," valued between $500 and $1000. At that time only 30 per cent of the population, or 566,357 persons, were urban, but by 1950 this has risen to 42 oer cent, or 929,021 persons. The number of persons imposed on what was already more than half slum had been doubled!

'Action was already under way in 1940 to increase housing facilities. The Housing Commission and the Puerto Rico Reconstruction Administration had financed some public construction. From 1938 to 1943 public housing authorities constructed 3631 low-rent dwelling units and 1057 land utility losts, largely out of a federal loan of 12 million dollars. Since 1943 the insular goverment has assigned 20 million dollars to add 3406 dwelling units and 3058 lots. Under the 1949 National Housing Act a six-year program provides for 30,000 dwelling units. Many of these dwellings are detached; indeed, it is asserted that the Puerto Nuevo project is the largest (670 acres) of this kind in the world. Other projects provide apartment buildings. Concrete is the material most commonly used, poured or in blocks, Frame construction is used in some "mimimum" as well as in "emergency" type dwellings, Economy of space is effected by dividing 380 square feet of floor space into three bedrooms. living-dining room, and kitchen; but all these houses are vast improvements on the miserable hovels still awaiting clearance in the slums of San Jose."

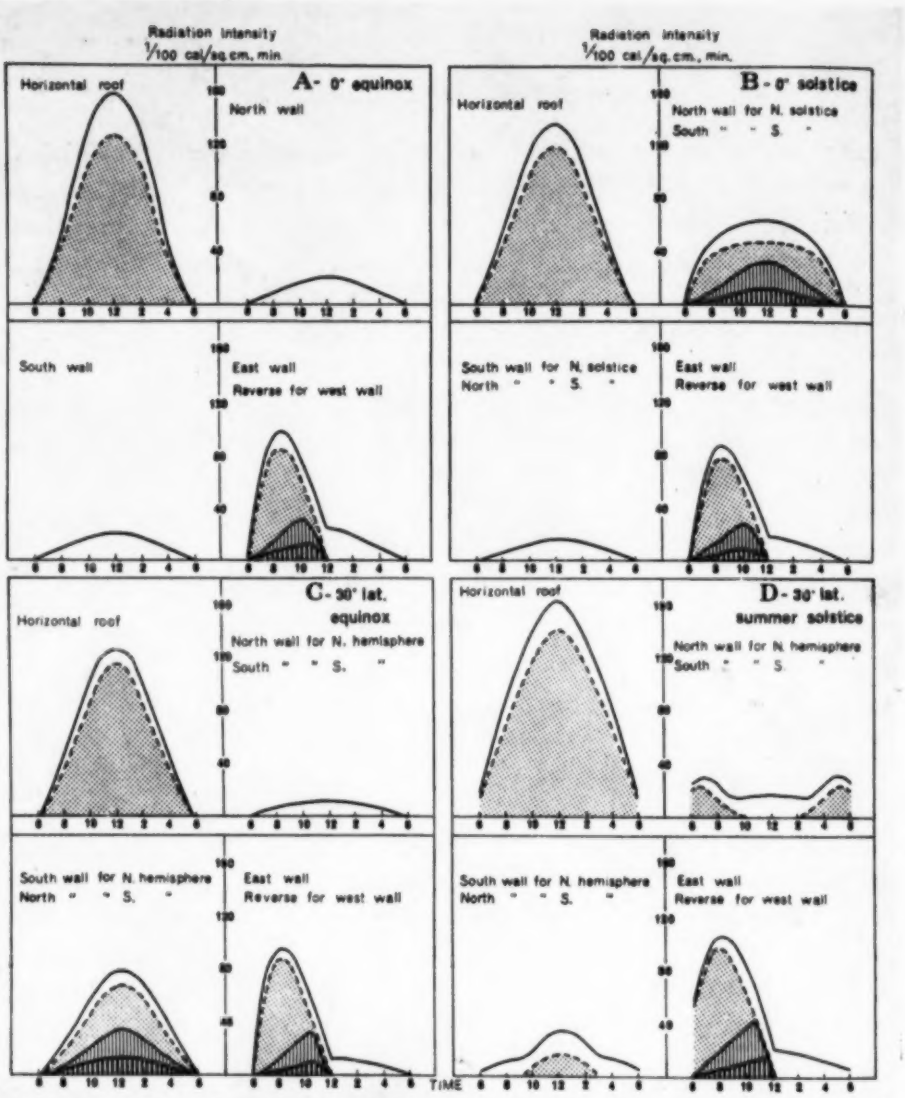


FIG. 1—Maximum intensity of radiation falling on horizontal roof and walls at different hours of the day. Solid line above white area, total radiation from sun, sky, and terrain; broken line above gray area, direct radiation from sun; solid line above lightly striped area, radiation cut off by horizontal projection at top of wall, equal to three-tenths of the wall height; solid line above heavily striped area, radiation cut off by horizontal projection at top of wall, equal to one-tenth wall height.

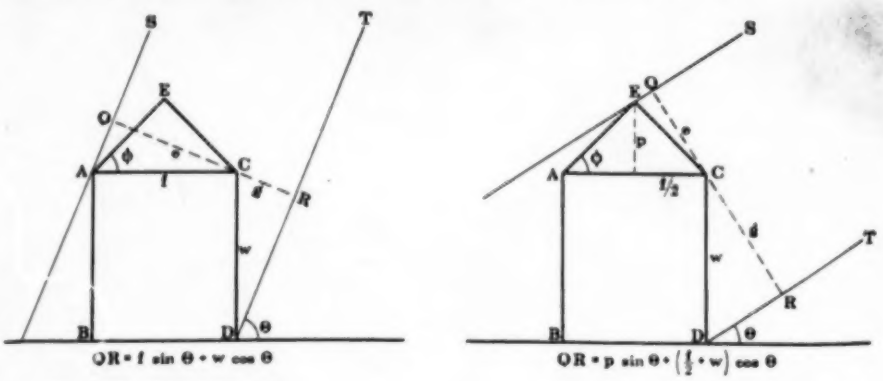


FIG. 2—See opposite page.

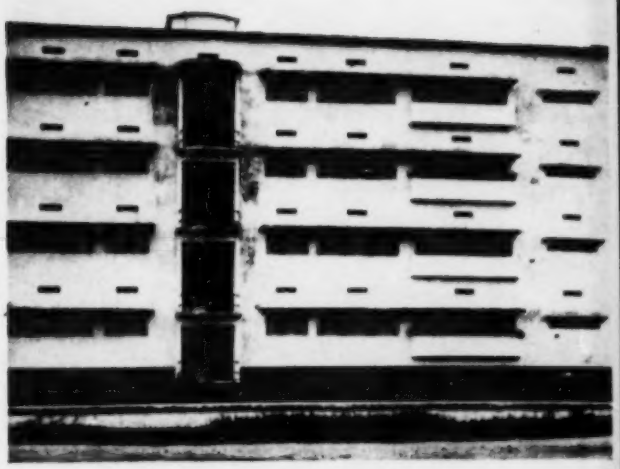


FIG. 7 (upper left)—Low-cost bungalow type. Léopoldville, Belgian Congo, altitude about 350 meters. A relatively cheap type of construction, with wide eaves to give shelter from sun and rain. However, the single row of comparatively small rooms does not constitute an attractive plan. Note roof ventilation.

FIG. 8 (upper right)—Modern apartment building. Léopoldville, Belgian Congo. On each floor a single apartment opens on each side of a central stairway. Ground floor has no walls and serves as playground, drying area, and car park. Kitchens are in a detached wing to the rear, connected with the apartments by bridges. Note stain of stucco facing by rain and mold.

FIG. 9 (lower left)—Undesirable import. Rest house at Yangambi, Belgian Congo, altitude about 450 meters. The only concessions to the tropical climate are the shades, like afterthoughts, over the windows, and the roof ventilation. Note stains on cement facing.

FIG. 10 (lower right)—Unsuitable type, apparently adapted partly from the European "villa." Léopoldville, Belgian Congo. House is too low on the ground, roof space is excessive and only partly ventilated, and eaves are too high and too narrow to be protective. Horizontal "eyebrows" over windows perform function that could have been served by well-placed eaves and conflict in style with rest of structure. Detached kitchen at rear repeats undesirable features.

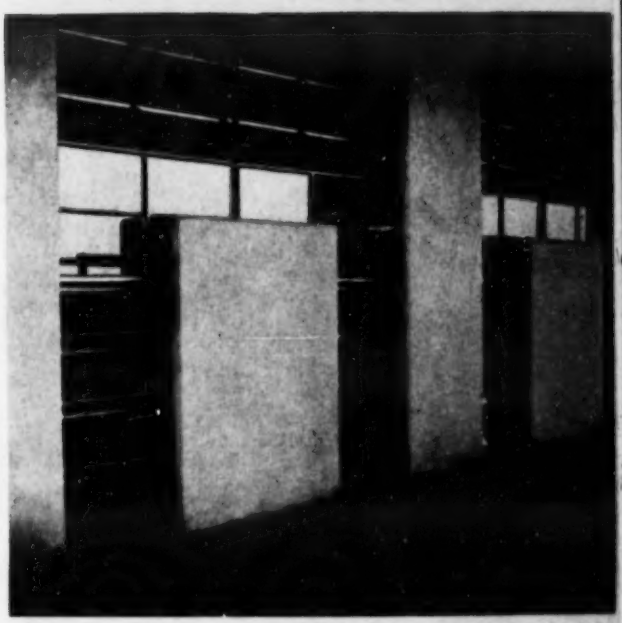


Fig. 15 (upper left)—Unsuitable type. Ramy Field, Puerto Rico. Eaves are much too small to afford adequate protection against rain or sun; swinging shutters shelter windows but do not keep sun off walls; stairways are exposed to rain, ensuring rapid deterioration. Intermediate height of foundation blocks provides most disadvantages of low construction and few advantages of high. Termite-excluding caps appear on all blocks, but it is doubtful if the steps are adequately protected.

Fig. 16 (upper right)—Excellent shading device for low-altitude sun. Rio de Janeiro, Brazil. Permanent vertical louvers set at angle on the north (sunny) side of the building. Windows are behind louvers.

Fig. 17 (lower left)—Good shading device. Belém, Brazil. Window shades of wooden slats, linked closely together and raised or lowered by means of a drum in the wall above the window opening, operated by an endless cloth tape inside the room. The metal slides in which the slats run are hinged halfway so that the lower portion of the frame can be pushed out from the window opening. If the cloth tape is under tension, narrow slits are kept between the slats; if relaxed, the slats pile snugly on top of one another from bottom up. However, this device is better for a Mediterranean type of climate than for an excessively rainy one.

Fig. 18 (lower right)—Extensive controllable ventilation. Campinas, Brazil, altitude about 800 meters. A veranda extends around the building and steel sash fills most of the walls below the veranda roof. Small pivoted windows allow control of entering breezes.

Linke, Lile. Houses, not hovels. How an Ecuadorean co-op got rid of Straw-mat Town. (Americas, Aug. 1956, vol. 8:8,pp. 3-7, with illus.) Humid

Reconstruction of Ambato, following an earthquake in 1949, had restored the city to near normal. Homes and other buildings had been rebuilt in the town that is situated in a high valley of the Andes. On a hill above Ambato, however, five hundred people live in shacks in a settlement called Ciudad Esteras or Straw-mat Town. The men earned about a dollar a day, the women worked as laborers, and families were large; they were not able to pay rent in Ambato which, since the earthquake has soared as 90 percent of the four thousand houses had been damaged.

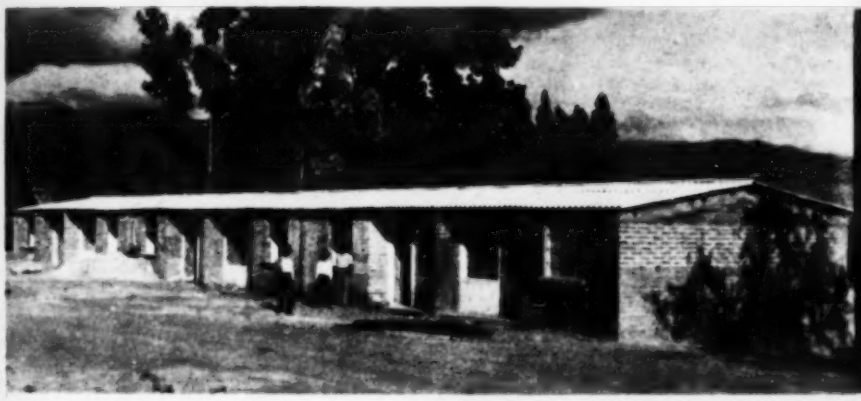
A young Colombian who was working for the Tungurahua Provincial Reconstruction Board, Dr. Manuel Cardenas, suggested a housing cooperative as a solution to the problems in Straw-mat Town. Dr. Cadenas set to work with the aid of his wife in 1952 on the slum that was typical of the substandard housing that exists throughout Latin America. First, they formed a housing cooperative in 1953, funds were contributed, and a community hall was donated by the Reconstruction Board, for meetings.

Plans for individual houses were drawn by a Colombian, Italo Daza. "The houses would be small, and for reasons of economy built in twos. Each would contain the essential facilities for a family of six: two small bedrooms with closets, a living-and-dining room, a kitchen, and a lavatory with shower. There would be ample room in the back patio for a brick-and-cement laundry and drying section, plus a small garden. Another bedroom or two could be added in the garden without altering the basic structure of the house. Space-saving closets and built-in shelves would reduce the need for furniture. Privacy was a paramount requirement in the close quarters of row houses (six to ten dwelling in each row built in rectangles with the gardens in the center). Six-foot walls around the patios helped, as did the facilities in each dwelling. (For most of the families it was the first time in their lives they had lived with running water.) The rows of houses were planned for different levels, following the undulating ground, avoiding monotony and the blocking of the view. The price, including an imported kerosene stove, would be 15,948 sucres (about $950) for each house and its 150-square-yard lot.

Naturally, the Cooperative could never have financed the houses alone. It obtained a mortgage from the Reconstruction Board covering the first 102 houses, and assumed responsibility for the regular monthly payment of seventy sucres (about $4.50) per house over the next twenty years. Later, the number of dwellings would be increased to two hundred."

Building began on July 3, 1954, World Cooperative Day. The basic structure of concrete and brick is earthquake resistant. Ingenious details facilitate subsequent enlargements and inside improvements. At present, the built-up area occupies sixty-five square yards, less than half of the lot. Window frames are of metal T-rods imported separately and assembled in Ambato, a type that is cheaper and more durable than the customary hand-made wooden frames because of the generally primitive working methods still employed by local carpenters. Easily available bamboo supports the ceiling. The asbestos-cement roof tiles came from Czechoslovakia."

Short cuts were adopted to reduce building costs, and owners were left to work out their own details according to their tastes and finances. Eloquent demonstrations of enthusiasms occurred repeatedly as members of the cooperative rendered mutual aid to their fellows. In order to help the adjustment from an overcrowed slum to a three-room house with kitchen and bath, a resident social worker was appointed. Teaching people to live in their environment was an important step after the new houses were provided, while the final step will be to encourage the residents to live in a cooperative community.



houses,

not hovels

National Association of Home Builders. NAHB Research Institute issues final report on Austin, Texas, air conditioned village. Washington, 1956. 5pp. (Home building news). Dry

The news release summarizes the technical report. The research was a major effort to reduce overall in-place cost of air conditioning in order to make its benefits available to more people. The release continues:

"The 22 homes in the NAHB Air Conditioned Village were started in 1953 and completed the following June with the cooperation and assistance of interested industry organizations. The houses and equipment, as well as the families living in the Village, were subjected to extensive research designed to test the performance of various design and construction types of air conditioning systems. The objectives were to obtain initial construction and operating cost information on air conditioning and provide technical data for (a) sizing equipment; (b) layout installation and operation, and (c) construction details on economical air conditioning.

Research at the project in 1955 disclosed that year-around heating and cooling operational costs averaged approximately $115.65 a year for the Village houses on the basis of Austin utility rates. The utilities included electricity, gas and water. This figure would, of course, vary with the climatic conditions and utility rates in other parts of the country.

Although not related specifically to the Austin project, the report also included the finding that the cost of air conditioning only would increase the monthly amortization payments of a 20-year mortgage by approximately $5.00. A compensatory factor in the family budget, however, is the reduction in the cost of away-from-home summertime dining and entertainment 'just to be comfortable.' There was an average difference of $5.80 a week between the outside entertainment expenses of the Village families and families living in non-air conditioned houses during the summer months.

The Institute suggested that home builders evaluate the sales advantages of air conditioning, as well as their local markets, before (a) offering an air conditioned home or (b) making provision for 'add-on' type of air conditioning to be added or omitted at time of sale. The latter was specifically recommended for low and medium priced houses.

The report outlined six items in the in-place cost of year-around air conditioning which should be taken into consideration by home builders. Some are obviously applicable to persons contemplating air conditioning in existing houses. The cost items:

Equipment; installation; cost due to interruption of normal construction program; cost of floor space, including that required for access as well as for the actual unit; maintenance cost during the warranty period, and cost of increase, if any, in construction specification requirements.

With regard to equipment costs, the report said: 'As with any product, mass production will produce a downward trend in factory costs. However, for the near future, the addition of refinements and improvements now being studied may offset such a trend. The Austin Village project has contributed to and stimulated the continuing industry efforts to provide improved quality, such as integral noise control and continuous fan operation.'

The report also noted that the trend in heating and cooling equipment is toward 'increased packaging and simplified installation methods, all aimed at reduction in field installation costs.'

The central air conditioning systems installed in the 22 Austin houses were of different manufacture and types. The houses are not identical and some, for reasons of research, were designed with temporary features considered undesirable for efficient air conditioning. The Village offered an excellent vehicle for

research and turned up significant information. However, the units in the individual houses were not comparable with each other in terms of operational costs and performances because of the varying heat loads and the conditions under which the tests were carried out. Data on individual units will not be made public. ...

The tests were conducted to determine the relative importance of the four principal elements producing comfort--air motion, relative humidity, air temperature and mean radiant temperature--and the values which are desirable to maintain in each.

'Comfort is more important than efficiency,' the Research Institute commented, 'but both are necessary for economical residential air conditioning.'

In determining the size of both heating and cooling systems it is necessary, in the former, to determine heat loss and, in the latter, the heat gain. The amount of heat or coolness required to offset the loss of gain determines the size of the unit required. A large number of factors enter into the calculations, including orientation of the house, design, type of construction, equipment, occupancy, location of windows and trees, and the size and location of the ducts."

Great open spaces: Prairie planning in Nairobi; Commentary on Nairobi, by Roger Johnson. (Architectural review, Sept. 1956, vol. 120:716. pp. 172-176, with illus., plans.)

Photographs and text by Roger Johnson are introduced in an editorial that emphasizes the appearance of urban blight in towns, south of the Sahara, that never had an urban pattern to destory.

"The legislative pattern," explains the editorial, "behind these sprawling towns depends on water-tight zoning laws, and the available empty space in which to realize them, sufficient empty space to leave dead strips as cordons sanitaires between one zone and another. This tendency to prairie-planning that leaves acres of real prairie, scrub, or jungle within the city limits is aided and abetted by grandiose Beaux-Arts paper plans that paralyse central area development within an inert abstract geometry of scaleless vistas and park-sized civic centres. Laid down, inevitably, across areas not yet built over, these paper diagrams tie up further areas of outback within the city, depriving it of the contact that such a new town needs between the unreclaimed wilderness without and the man-made urbanity that should exist within."

Roger Johnson's commentary on the photographs, four of which follow this digest, concludeswith a plan for three interlocking spaces, each with character derived from the predominant racial group. Nairobi's growth which began in 1899 continues to the present with a population of over 100,000 persons. Figure 5 shows the original town street and, on the right, several original buildings, while on the left are newer buildings of a different character. In and around the two hotels facing each other across the round-about Europeans congregate in the only real meeting place. The illustration of the City Square surrounded with Law Courts and public buildings, is , obviously in Beaux-Arts pattern, showing as much emptiness of space at the center of the city as there is beyond its boundaries.

Nairobi has a population of Europeans, Asians and Africans in the rough proportion of 1:3:6. By accepting the idea of a multi-racial state, three interlocking piazzas would provide the core of city life. One piazza would be predominantly a European shopping center, another for Asians, and a more open space with eating stalls for Africans, as the last group could not afford higher rents. At lunch-time the scene would include African clerks and messengers eating and sleeping in the shade, together with their womenfolk with colorful dress, the Indian quarter with its smell of spices and the activity of furniture shops, tinsmiths, and shoe shops, and finally the mainly European cafés under shade.

Given a wide-open plain, and an airport, the scene in the upper picture is probably inevitable and technically excusable. But given a point where plains and hills meet, and a town, the scene in the lower picture is beyond excuse. That the townscape of Nairobi should be almost as empty as the landscape of its airfield, that the wide-open spaces which surround the town should be allowed to penetrate inside it — these typify all-too-common faults of Commonwealth urbanism, discussed in the article by Roger Johnson on the pages which follow.

5

In the foreground of 5 can be seen the junction of Government Street, Nairobi's oldest thoroughfare, with the newer Delamere Avenue, whose trees, as can be seen, are both ineffective and inadequate as shelter for parked cars. This road junction has become the natural centre of Nairobi life, and – whatever its drawbacks – it is clearly preferable to 6, City Square, the sprawling shadeless center proposed by the 1948 master plan.

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Doxiadis, K. A. The Greek city plan. (Landscape, autumn. 1956, vol. 6:1, pp. 19-26, with map, plans.) Dry

From K. A. Doxiadis, Raumordnung im Griechischen Staedtebau, 1937.

Messina, Mario. Une ville residentielle en pleine nature. Roma, Uesisa. 1953. unp., illus., map, plans. Text in French and Italian. Dry

The scheme for Donabo includes a region of 1,500,000 square meters lying along the tip of the cape of northwest Africa. It is seven kilometers from Tangier and situated within the international zone. The character is varied, with outcroppings of rock throughout a general wooded area, and a stream cutting across one corner of the land.

The lands of Donabo are owned by French interests in Morocco which are determined to develop the area as an urban center along the lines of a tourist resort. Dominant elements in the design were:

1. Zone résidentielle de grand luxe.

2. Cité -jardin: constructions extensives basses, dégagées (ville presentant le plus faible rapport de surface couverte); extensives hautes, dégagées (immeubles de trois etages); semi intensives (immeubles de six etages).

3. Voirie assurant le maximum de confort possible aux unités résidentielles tout en sauvegardant l'esthétique du valeur déterminante.

4. Services generaux et services speciaux se suffisant a` eux-memes, y compris pour les loisirs (nage, tennis, boules, bowling américain, golf-miniature, camping, etc.)

5. Equipement des hotels de luxe, hotels à petits pavillons (Motels) pour un bref séjour ou une villégisture.

The basic idea of the plan is justified by the undeniable facts that the beauty of the site is not surpassed by better known tourist centers such as Capri, Amalfi, La Cote d'Azur, Deauville, Miami, etc., that its geographic location at the gateway to an international city gives it a richness and civil security derived from political status, that it lies at the crossroads of the most frequented maritime lines (Detroit to Gibraltar), and that the character of the investment is unusual and original.

The zoning scheme was evolved in accordance with the extreme fastidiousness of the population and with its social characteristics. Large areas are devoted to buildings of refinement and of comfort, with thought for maximum collective and individual comfort, while at the same time preserving the beauty of the landscape, and respecting local folklore and international customs. Two zones, an outer and inner contain the principal residential core, the private villas. The commercial centers are placed along the axis descending toward the sea, in order to be generally accessible and to take advantage of the view of the sea. The general layout has followed the outline of a former route around Cap Spartel and the network of roads takes into consideration the terrain. Two kinds of roads have been established: principal ways and minor streets. The latter are reserved for pedestrians and are parallel or at right angles to the principal roads. They will be used also for electric, hydraulic and telephone service. In size, individual lots vary from 2,000 to 3,000 square meters.

The chief center of attraction is formed by a group including swimming pools with bar, restaurant and dance-hall. There is one covered and three uncovered pools. The last are arranged on different levels so that cascades of water flow from one to the other, creating a scenic effect. The pools vary in depth and dimensions for the use of adults or children. The largest pool has been so planned that eventually it could be used for water sports or theatricals. A passage under the upper cascade provides a view through port-holes below the surface of the water. Altogether the pools and their accessory equipment can accommodate 400 swimmers. And finally, terraces and lawns complete the unit.

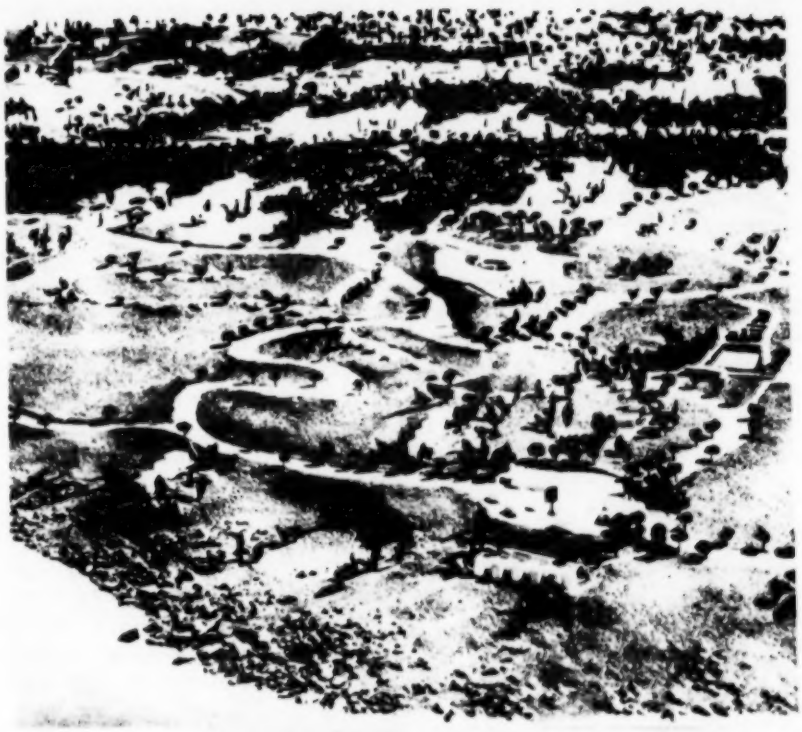
A restaurant for about 230 persons, a dance hall for about 150 persons, a bar, and administrative offices are grouped in the pavilion adjoining the swimming pools. Parking for automobiles has been provided for visitors. Besides, the pools, other attractions of climate, of sport, of tourist interest are furnished. There is a "Solarium" for about 150 persons composed of separate compartments either planted like lawns or specially paved to create a happy environment from the psychological point of view for sun therapy. There is also a small bar, dressing-rooms, and other comforts. Beyond the "Solarium" are the tennis courts, ball fields, bowling alleys, golf ranges, and other provisions for outdoor sports.

The commercial center serves to unite the world of affairs with local services. It contains various agencies, a hotel, a restaurant, a cinema, shops, bank, and parking space. For this reason it is situated on the nearest approach to Tangier.

A motel is defined here as a kind of hotel composed of a series of individual apartments on various floors, each private but dependent upon services placed under one organization. With regard for the terrain three types of bungalows have been planned with the following sizes: 22, 35 and 44 square meters. Each unit has, besides a bedroom, a living-room, a dining alcove, a small kitchen, a veranda. The grouping of the bungalows is dicated by the view, the topography, etc. As these motels are essentially for tourists they have been placed near the sea and on the axis for the group formed by the swimming-pool and solarium and sport grounds. The architecture is inspired by the Mediterranean style in which total masses, stairways and chimneys all form part of a charming picture.

The residential zone consists in large part of villas. For a cosmopolitant population it has been necessary to have a supple architectural style. Here there are large villas and small, villas for permanent residence, for the season, or very small for the week-end.

Donabo is more of a garden than a garden-city. Its rich vegetation has been incorporated into the plan as parks, open-spaces, and individual gardens.



Vues de la maquette générale.

Vedute del plastico generale.

Models showing general layout with roads and subdivision of lots.

Massachusetts Institute of Technology. Solar air conditioning. (In its Reports on research, June 1956, vol. 7:8 p. 3.)

The article is reprinted in full below:

For many years there has been considerable concern over man's deficit financing with regard to energy consumption. Believing that many power requirements could be met from solar energy, as early as 1938, Godfrey L. Cabot provided funds for the Institue to conduct research in the collection, conversion, and utilization of solar energy.

In 1941, Hoyt C. Hottel, Professor of Chemical Engineering, and Byron Woertz (then research associate at M.I.T.) made the first comprehensive theoretical study of means by which heating could be predicted from solar radiation data. This basic research showed that efficiencies of 30 to 35 per cent could be expected from flat plate collectors. The Institute has already built two solar houses heated largely by solar energy trapped by flat plate collectors. The second of these, located on Memorial Drive near M.I.T., was occupied continuously by a student family from spring 1949 until December 1955. These early experimental buildings have yielded enough information to permit designing a truly commercial type of solar-heated house.

The success of any solar heating system depends to a great extent on conserving collected heat by insulation, orientation of collector plates, and limiting the heat-loss surface to as small an effective area as possible. The shape of the house has a decided effect on the possibilities for successful solar heating. A two-story house, rectangular in plan, facing south, and with length about 1.1 to 1.6 times the width proved to be most efficient for solar energy heating.

A new solar house is now being planned for construction in which the heat collector plates will consist of black painted aluminum sheet with copper tubing fastened to the back. Water flowing through the tubing is used for heat removal and storage. Two layers of glass mounted in wood frames with air spaces of three-quarter inch will insulate against outward heat losses from the collecting surface. Air spaces prevent large losses by conduction and convection, while the glass layers prevent long wave radiation from the plate to the outside. About 600 square feet of collector plate will be employed and will heat water stored in a 1,500 gallon tank. Weather analysis shows that complete solar heating is uneconomical in New England, and an oil-fired boiler will provide supplementary heating as needed. It is estimated that, with this arrangement, solar heating will provide about 80 per cent of the required heating.

The determining factor in the immediate use of solar energy is the cost of the flat plate collector. Maintenance-free, long service life under extreme service conditions are complicating factors. Complete prefabrication of economical unit collectors is probably better left to large industrial organization who, when convinced of a large market for such a product, can bring their heavy weapons to bear upon the problem.

A study of the feasibility of refrigeration by means of solar energy and the performance and efficiency of such systems has also been undertaken recently. Solar refrigeration would make possible a more favorable load factor throughout the year in temperate zones and make good use of excess radiation in the tropics.

Detroit disposes of Gratiot land. (National Association of Housing & Redevelopment Officials, Newsletter, Aug. 31, 1956, vol. 8:16, pp. 2-3, with illus.)

Detroit redevelopment begins. (Journal of housing, Aug.-Sept. 1956, vol. 13:8, pp.284-286, with illus.)
Original Gratiot plan, now called, Lafayette Park University City, to include housing for all economic groups and for all types of family composition. Ludwig Mies van des Rohe has designed four main building types: 22-story towers, 2-story terrace buildings, one-story court buildings, town houses.

Housing project: the Homestyle Center. (Arts & architecture, Sept. 1956, vol. 73:9, pp. 28-30, with illus., plan.)

Project of the Home Research Center to be built on an 80-acre site on the outskirts of Grand Rapids, Michigan, as a display center for 50 houses. Objective is to serve as a continuing research center in which many outstanding architects are now taking part.

Syracuse, N.Y. Bureau of Municipal Research. Report on new residential construction near two public housing projects. Syracuse, 1955. 5pp., maps.
Salt City Homes and Eastwood Homes: two state-aided, low-rental housing projects.

Washington, D.C. Central city housing: return to the outdoor room. (Architectural forum, Sept. 1956, vol. 105:3, p. 121, with illus., plan.)
Revival of row-house-outdoor room planning for Southwest Washington Scheme, by I. M. Pei and Harry Weese.

Washington, D. C., redeveloper explains reasoning behind his firm's investment. (Journal of housing, Aug.-Sept., 1956, vol. 13:8, pp. 284-286, 288, with illus.)

Project to include 29 acres of former slum land in southwest Washington, designated Southwest Area B. Land has been cleared for 1050 rental units consisting of 650 elevator apartments and 400 town houses.

THESES FOR DOCTORATE DEGREE IN AMERICAN COLLEGES, 1955 APPENDIX 2.

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Sahaib, Haiim. Social-psychological analysis of Arab nationalist movement in Iraq. University of Chicago, 1955.

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Fals-Borda, Orlando. A sociological study of the relationships between man and the land in the Department of Boyaca, Colombia. University of Florida, Gainesville, Fla., 1955.

Knowlton, C.S. Spatial and social mobility of the Syrians and Lebanese in the city of Sao Paulo, Brazil. Vanderbilt University, Nashville, Tenn., 1955.

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Amouzegar, Jahangir. The role of the U.S. technical assistance in the development of underdeveloped countries with special reference to Iran. University of California, Los Angeles, Calif., 1955.

Shatia, R.S. The role of foreign investment in the economic development of India. Columbia University, 1955.

Singh, Bhagat. An appraisal of the agricultural program in the first five year plan of Patiala and East Punjab States Union, India. Cornell University, 1955.

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